

B. AMENDMENTS TO CLAIMS

Please amend the claims as indicated hereinafter and add new Claims 24-64.

1 1. (CURRENTLY AMENDED) A method of generating an external correlation key
2 value for use in correlating alarms emitted by network elements or system elements in
3 a telecommunications network, the method comprising the steps of:
4 receiving an alarm message generated by a network element or system element of the
5 telecommunications network;
6 identifying a context value in the alarm message;
7 retrieving, based upon the context value in the alarm message, from a table that
8 associates context values to internal correlation key value formulas, a formula
9 specifying how to generate an internal correlation key value;
10 creating and storing the internal correlation key value based on the formula;
11 ~~creating a unique~~ generating the external correlation key value based on the internal
12 correlation key value; and
13 sending the alarm message and external correlation key value to an external system
14 for use in correlating alarms.

1 2. (CURRENTLY AMENDED) A method as recited in Claim 1, wherein the alarm
2 message is an SNMP message, the context value is an SNMP context string, and the
3 external correlation key value is an ordinal number.

1 3. (CURRENTLY AMENDED) A method as recited in Claim 1, wherein the external
2 system is an OSS ~~system~~ of a telecommunications service provider.

1 4. (CURRENTLY AMENDED) A method as recited in Claim 1, wherein the table is
2 stored at a gateway that is logically located in the telecommunication network

3 between the network element or system element and an OSS ~~system~~ of a
4 telecommunications service provider.

1 5. (ORIGINAL) A method as recited in Claim 1, wherein each formula in the table
2 specifies, for an associated context value, one or more ordinal positions of fields in
3 the alarm message.

1 6. (ORIGINAL) A method as recited in Claim 1, further comprising the steps of storing
2 the internal correlation key value into an internal work area, and generating the
3 external correlation key value that uniquely represents the internal correlation key
4 value.

1 7. (CURRENTLY AMENDED) A method as recited in Claim 1, wherein each formula
2 in the table specifies, for an associated context value, one or more fields in the alarm
3 message, a concatenation of which yields the internal correlation key value.

1 8. (CURRENTLY AMENDED) A method as recited in Claim 1, wherein each formula
2 in the table specifies one or more pattern matching procedures to extract one or more
3 fields from the alarm message, a concatenation of which yields the internal
4 correlation key value.

1 9. (ORIGINAL) A method as recited in Claim 1, wherein each formula in the table
2 specifies, for an associated context value, one or more ordinal positions of fields in the
3 alarm message and one or more references to objects in an external database system.

1 10. (ORIGINAL) A method as recited in Claim 1, wherein each formula in the table
2 specifies, for an associated context value, one or more ordinal positions of fields in
3 the alarm message and one or more references to programmatic procedures that are
4 stored in an external database system.

1 11. (CURRENTLY AMENDED) A method as recited in Claim 1, wherein each formula
2 in the table specifies, for an associated context value, one or more ordinal positions of
3 fields in the alarm message and one or more references to programmatic procedures
4 that are stored in an external database system, and wherein a concatenation of the
5 fields and a result value from execution of the programmatic procedures yields the
6 internal correlation key value.

1 12. (ORIGINAL) A method as recited in Claim 1, further comprising the steps of
2 compressing the external correlation key value such that the external correlation key
3 value is stored in fewer bits than the internal correlation key value.

1 13. (CURRENTLY AMENDED) A method as recited in Claim 1, wherein the table is
2 stored at a gateway that is logically located in the telecommunication network
3 between the network element or system element, and an OSS ~~system~~ of a
4 telecommunications service provider; wherein each formula in the table specifies, for
5 an associated context value, one or more ordinal positions of fields in the alarm
6 message and one or more references to objects in an external database system that is
7 accessible to the gateway; and wherein a concatenation of the fields and objects
8 yields the internal correlation key value; and further comprising the steps of
9 compressing the external correlation key value such that the external correlation key
10 value is stored in fewer bits than the internal correlation key value.

1 14. (ORIGINAL) A method as recited in Claim 1, further comprising the steps of:
2 storing the internal correlation key value and external correlation key value in a
3 persistent work area;
4 retrieving the external correlation key value from the persistent work area.

1 15. (CURRENTLY AMENDED) A method as recited in Claim 1, wherein sending the
2 alarm message and correlation key value comprises sending an SNMP message to an
3 OSS ~~system~~ that includes a complete SNMP object carrying the alarm message and
4 the external correlation key value in an SNMP field.

1 16. (CURRENTLY AMENDED) A method as recited in Claim 1, wherein sending the
2 alarm message and correlation key value comprises sending an XML file to an OSS
3 ~~system~~ that includes the alarm message and the external correlation key value
4 identified by unique XML tags.

1 17. (CURRENTLY AMENDED) A computer-readable medium carrying ~~one or more~~
2 ~~sequences of instructions~~ for generating an ~~internal correlation key value~~ and external
3 correlation key value for use in correlating alarms emitted by network elements or
4 system elements in a telecommunications network, which instructions, when executed
5 by one or more processors, cause ~~the one or more processors to carry out the steps of:~~
6 receiving an alarm message generated by a network element or system element of the
7 telecommunications network;
8 identifying a context value in the alarm message;
9 retrieving, based upon the context value in the alarm message, from a table that
10 associates context values to internal correlation key value formulas, a formula
11 specifying how to generate the internal correlation key value;
12 creating and storing the internal correlation key value based on the formula;
13 generating the external correlation key value based on the internal correlation key
14 value; and

15 sending the alarm message and external correlation key value to an external system
16 for use in correlating alarms.

1 18. (ORIGINAL) A computer-readable medium as recited in Claim 17, wherein each
2 formula in the table specifies, for an associated context value, one or more fields in
3 the alarm message, a concatenation of which yields the internal correlation key value.

1 19. (ORIGINAL) A computer-readable medium as recited in Claim 17, wherein each
2 formula in the table specifies, for an associated context value, one or more ordinal
3 positions of fields in the alarm message and one or more references to programmatic
4 procedures that are stored in an external database system.

1 20. (ORIGINAL) A computer-readable medium as recited in Claim 17, wherein each
2 formula in the table specifies, for an associated context value, one or more ordinal
3 positions of fields in the alarm message and one or more references to programmatic
4 procedures that are stored in an external database system, and wherein a
5 concatenation of the fields and a result value from execution of the programmatic
6 procedures yields the internal correlation key value.

1 21. (CURRENTLY AMENDED) A computer-readable medium as recited in Claim 17,
2 wherein the table is stored at a gateway that is logically located in the
3 telecommunication network between the network element or system element and an
4 OSS ~~system~~ of a telecommunications service provider; wherein each formula in the
5 table specifies, for an associated context value, one or more ordinal positions of fields
6 in the alarm message and one or more references to objects in an external database
7 system that is accessible to the gateway; and wherein a concatenation of the fields and
8 objects yields the correlation key value.

1 22. (CURRENTLY AMENDED) An apparatus for generating ~~a correlation~~ an external
2 correlation key value for use in correlating alarms emitted by network elements or
3 system elements in a telecommunications network, comprising:
4 means for receiving an alarm message generated by a network element or system
5 element of the telecommunications network;
6 means for identifying a context value in the alarm message;
7 means for retrieving, based upon the context value in the alarm message, from a table
8 that associates context values to internal correlation key value formulas, a
9 formula specifying how to generate the internal correlation key value;
10 means for creating and storing the internal correlation key value based on the
11 formula; ~~and~~
12 means for generating the external correlation key value based on the internal
13 correlation key value; and
14 means for sending the alarm message and the external correlation key value to an
15 external system for use in correlating alarms.

1 23. (CURRENTLY AMENDED) An apparatus for generating ~~a correlation~~ an external
2 key value for use in correlating alarms emitted by network elements or system
3 elements in a telecommunications network, comprising:
4 a network interface that is coupled to the data network for receiving one or more
5 packet flows therefrom;
6 a processor; and
7 ~~one or more stored sequences of instructions~~ which, when executed by the processor,
8 cause ~~the processor to carry out the steps of:~~

9 receiving an alarm message generated by a network element or system
10 element of the telecommunications network;
11 identifying a context value in the alarm message;
12 retrieving, based upon the context value in the alarm message, from a table
13 that associates context values to internal correlation key value
14 formulas, a formula specifying how to generate the internal correlation
15 key value;
16 creating and storing the internal correlation key value based on the formula;
17 ~~and~~
18 generating the external correlation key value based on the internal correlation
19 key value; and
20 sending the alarm message and external correlation key value to an external
21 system for use in correlating alarms.

1 24. (NEW) A computer-readable medium as recited in Claim 17, wherein the alarm
2 message is an SNMP message, the context value is an SNMP context string, and the
3 external correlation key value is an ordinal number.

1 25. (NEW) A computer-readable medium as recited in Claim 17, wherein the external
2 system is an OSS of a telecommunications service provider.

1 26. (NEW) A computer-readable medium as recited in Claim 17, wherein the table is
2 stored at a gateway that is logically located in the telecommunication network
3 between the network element or system element and an OSS of a telecommunications
4 service provider.

- 1 27. (NEW) A computer-readable medium as recited in Claim 17, wherein each formula in
2 the table specifies, for an associated context value, one or more ordinal positions of
3 fields in the alarm message.
- 1 28. (NEW) A computer-readable medium as recited in Claim 17, further comprising the
2 steps of storing the internal correlation key value into an internal work area, and
3 generating the external correlation key value that uniquely represents the internal
4 correlation key value.
- 1 29. (ORIGINAL) A computer-readable medium as recited in Claim 17, wherein each
2 formula in the table specifies one or more pattern matching procedures to extract one
3 or more fields from the alarm message, a concatenation of which yields the internal
4 correlation key value.
- 1 30. (ORIGINAL) A computer-readable medium as recited in Claim 17, wherein each
2 formula in the table specifies, for an associated context value, one or more ordinal
3 positions of fields in the alarm message and one or more references to objects in an
4 external database system.
- 5 31. (NEW) A computer-readable medium as recited in Claim 17, further comprising the
6 steps of compressing the external correlation key value such that the external
7 correlation key value is stored in fewer bits than the internal correlation key value.
- 1 32. (NEW) A computer-readable medium as recited in Claim 17, further comprising the
2 steps of:
3 storing the internal correlation key value and external correlation key value in a
4 persistent work area;
5 retrieving the external correlation key value from the persistent work area.

1 33. (NEW) A computer-readable medium as recited in Claim 17, wherein sending the
2 alarm message and correlation key value comprises sending an SNMP message to an
3 OSS that includes a complete SNMP object carrying the alarm message and the
4 external correlation key value in an SNMP field.

1 34. (NEW) A computer-readable medium as recited in Claim 17, wherein sending the
2 alarm message and correlation key value comprises sending an XML file to an OSS
3 that includes the alarm message and the external correlation key value identified by
4 unique XML tags.

1 35. (NEW) An apparatus as recited in Claim 23, wherein the alarm message is an SNMP
2 message, the context value is an SNMP context string, and the external correlation
3 key value is an ordinal number.

1 36. (NEW) An apparatus as recited in Claim 23, wherein the external system is an OSS of
2 a telecommunications service provider.

1 37. (NEW) An apparatus as recited in Claim 23, wherein the table is stored at a gateway
2 that is logically located in the telecommunication network between the network
3 element or system element and an OSS of a telecommunications service provider.

1 38. (NEW) An apparatus as recited in Claim 23, wherein each formula in the table
2 specifies, for an associated context value, one or more ordinal positions of fields in
3 the alarm message.

1 39. (NEW) An apparatus as recited in Claim 23, further comprising one or more
2 additional instructions which, when executed by the processor, cause storing the
3 internal correlation key value into an internal work area, and generating the external
4 correlation key value that uniquely represents the internal correlation key value.

- 1 40. (NEW) An apparatus as recited in Claim 23, wherein each formula in the table
2 specifies, for an associated context value, one or more fields in the alarm message, a
3 concatenation of which yields the internal correlation key value.
- 1 41. (NEW) An apparatus as recited in Claim 23, wherein each formula in the table
2 specifies one or more pattern matching procedures to extract one or more fields from
3 the alarm message, a concatenation of which yields the internal correlation key value.
- 1 42. (NEW) An apparatus as recited in Claim 23, wherein each formula in the table
2 specifies, for an associated context value, one or more ordinal positions of fields in the
3 alarm message and one or more references to objects in an external database system.
- 1 43. (NEW) An apparatus as recited in Claim 23, wherein each formula in the table
2 specifies, for an associated context value, one or more ordinal positions of fields in
3 the alarm message and one or more references to programmatic procedures that are
4 stored in an external database system.
- 1 44. (NEW) An apparatus as recited in Claim 23, wherein each formula in the table
2 specifies, for an associated context value, one or more ordinal positions of fields in
3 the alarm message and one or more references to programmatic procedures that are
4 stored in an external database system, and wherein a concatenation of the fields and a
5 result value from execution of the programmatic procedures yields the internal
6 correlation key value.
- 1 45. (NEW) An apparatus as recited in Claim 23, further comprising one or more additional
2 instructions which, when executed by the processor, cause compressing the external
3 correlation key value such that the external correlation key value is stored in fewer bits
4 than the internal correlation key value.

1 46. (NEW) An apparatus as recited in Claim 23, wherein the table is stored at a gateway
2 that is logically located in the telecommunication network between the network
3 element or system element, and an OSS of a telecommunications service provider;
4 wherein each formula in the table specifies, for an associated context value, one or
5 more ordinal positions of fields in the alarm message and one or more references to
6 objects in an external database system that is accessible to the gateway; and wherein a
7 concatenation of the fields and objects yields the internal correlation key value; and
8 the apparatus further comprises one or more additional instructions which, when
9 executed by the processor, cause compressing the external correlation key value such
10 that the external correlation key value is stored in fewer bits than the internal
11 correlation key value.

1 47. (NEW) An apparatus as recited in Claim 23, further comprising one or more
2 additional instructions which, when executed by the processor, cause:
3 storing the internal correlation key value and external correlation key value in a
4 persistent work area;
5 retrieving the external correlation key value from the persistent work area.

1 48. (NEW) An apparatus as recited in Claim 23, wherein sending the alarm message and
2 correlation key value comprises sending an SNMP message to an OSS that includes a
3 complete SNMP object carrying the alarm message and the external correlation key
4 value in an SNMP field.

1 49. (NEW) An apparatus as recited in Claim 23, wherein sending the alarm message and
2 correlation key value comprises sending an XML file to an OSS that includes the
3 alarm message and the external correlation key value identified by unique XML tags.

- 1 50. (NEW) An apparatus as recited in Claim 22, wherein the alarm message is an SNMP
2 message, the context value is an SNMP context string, and the external correlation
3 key value is an ordinal number.
- 1 51. (NEW) An apparatus as recited in Claim 22, wherein the external system is an OSS of
2 a telecommunications service provider.
- 1 52. (NEW) An apparatus as recited in Claim 22, wherein the table is stored at a gateway
2 that is logically located in the telecommunication network between the network
3 element or system element and an OSS of a telecommunications service provider.
- 1 53. (NEW) An apparatus as recited in Claim 22, wherein each formula in the table
2 specifies, for an associated context value, one or more ordinal positions of fields in
3 the alarm message.
- 1 54. (NEW) An apparatus as recited in Claim 22, further comprising means for storing the
2 internal correlation key value into an internal work area, and generating the external
3 correlation key value that uniquely represents the internal correlation key value.
- 1 55. (NEW) An apparatus as recited in Claim 22, wherein each formula in the table
2 specifies, for an associated context value, one or more fields in the alarm message, a
3 concatenation of which yields the internal correlation key value.
- 1 56. (NEW) An apparatus as recited in Claim 22, wherein each formula in the table
2 specifies one or more pattern matching procedures to extract one or more fields from
3 the alarm message, a concatenation of which yields the internal correlation key value.
- 1 57. (NEW) An apparatus as recited in Claim 22, wherein each formula in the table
2 specifies, for an associated context value, one or more ordinal positions of fields in the
3 alarm message and one or more references to objects in an external database system.

1 58. (NEW) An apparatus as recited in Claim 22, wherein each formula in the table
2 specifies, for an associated context value, one or more ordinal positions of fields in
3 the alarm message and one or more references to programmatic procedures that are
4 stored in an external database system.

1 59. (NEW) An apparatus as recited in Claim 22, wherein each formula in the table
2 specifies, for an associated context value, one or more ordinal positions of fields in
3 the alarm message and one or more references to programmatic procedures that are
4 stored in an external database system, and wherein a concatenation of the fields and a
5 result value from execution of the programmatic procedures yields the internal
6 correlation key value.

1 60. (NEW) An apparatus as recited in Claim 22, further comprising means for
2 compressing the external correlation key value such that the external correlation key
3 value is stored in fewer bits than the internal correlation key value.

1 61. (NEW) An apparatus as recited in Claim 22, wherein the table is stored at a gateway
2 that is logically located in the telecommunication network between the network
3 element or system element, and an OSS of a telecommunications service provider;
4 wherein each formula in the table specifies, for an associated context value, one or
5 more ordinal positions of fields in the alarm message and one or more references to
6 objects in an external database system that is accessible to the gateway; and wherein a
7 concatenation of the fields and objects yields the internal correlation key value; and
8 the apparatus further comprises means for compressing the external correlation key
9 value such that the external correlation key value is stored in fewer bits than the
10 internal correlation key value.

1 62. (NEW) An apparatus as recited in Claim 22, further comprising means for:
2 storing the internal correlation key value and external correlation key value in a
3 persistent work area;
4 retrieving the external correlation key value from the persistent work area.

1 63. (NEW) An apparatus as recited in Claim 22, wherein sending the alarm message and
2 correlation key value comprises sending an SNMP message to an OSS that includes a
3 complete SNMP object carrying the alarm message and the external correlation key
4 value in an SNMP field.

1 64. (NEW) An apparatus as recited in Claim 22, wherein sending the alarm message and
2 correlation key value comprises sending an XML file to an OSS that includes the
3 alarm message and the external correlation key value identified by unique XML tags.